Science Skills - Progression through the National Curriculum

- Working Scientifically and the scientific processes should be taught alongside all Science topics.
- NC objectives are in bold at the end of each section (These are written for Key stages and therefore are not broken down into each year group).
- There are progressions of each skill or method in each box, it is not a tick list but a guide. Remember to check for previous knowledge/acquisition of skill or method.
- Each topic should start with questioning and across the topic all five methods of Working Scientifically should be used. Reporting should be done where appropriate and modelled.

Skills	EYFS	KS1	LKS2	UKS2
Questioning	• Ask questions. • Demonstrate curiosity about the world around them. • **Make comments about what they have heard and ask questions to clarify their understanding.**	• Demonstrate curiosity, e.g. ask 'why?' or 'how?' about the world around them. • Understand the concept of 'a question'. • Be able to ask a question • Be able to suggest one way of finding an answer to a question. • Understand that some questions can be answered by testing. • With help, identify evidence that can be used to answer questions. • Present evidence they have collected in simple tables, charts or diagrams. • **Ask simple questions and recognise that they can be answered in different ways**	• Make own decisions about which method of enquiry is best to answer a question. • Be able to refine a question. • Draw simple conclusions and talk about what they have found out using some scientific language. • Draw simple conclusions and write about what they have found out using some scientific language. • Use relevant scientific language to discuss their ideas. • Use relevant scientific language to communicate their findings. • Communicate • their ideas in ways that are appropriate for different audience. • Use a variety of written communication methods, e.g. guides, keys, drawings and other pictorial representations which are suggested to them. • Choose their own way of communicating ideas to different audiences. • **Asking relevant questions and using different types of scientific enquiries to answer them.** • **Using straightforward scientific evidence to answer questions or to support their findings.**	• Explore and talk about their own ideas. • Ask pertinent questions. • Explore ideas and raise different kinds of questions about scientific phenomena. • Refine a scientific question so that it can be tested. • Understand that some scientific questions cannot be answered by a particular investigation. • Be able to suggest changes to questions following collection/analysis of data. • Understand a range of enquiries can be used together to explore an answer to a question. • Recognise key aspects of a scientific question. • **Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.**

Observing over time	• Use senses and simple equipment to explore the world around them, e.g. binoculars and magnifying glasses. • Look carefully and notice interesting details and changes they see. E.g. when making playdough/ seasons walks/ cooking. • **Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps.** • **Explore the natural world around them, making observations and drawing pictures of animals and plants.**	• Understand that we can gather information about the world through our senses. • Understand that observation involves all of the senses. • Use simple equipment provided, e.g. hand lenses, to make more accurate observations. • Recognise that some observable features may change over time, e.g. the size of a plant. • Use a range of equipment correctly to observe and measure. • Be able to select appropriate equipment to observe. • **Observe closely, using simple equipment.**	• Be able to select appropriate equipment to observe and measure. • Use new equipment such as data loggers, appropriately. • Accurately use standard measures. • Accurately use standard measures. • Use new equipment such as data loggers, appropriately. • Be able to select appropriate equipment to observe and measure. • **Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.**	• Make their own decisions about what observations to make, what measurements to use and for how long to make them, and whether to repeat them. • Choose the most appropriate equipment to make measurements and explain how to use it accurately. • Recognise that some measurements or observations may need to be repeated. • Repeat observations or measurements appropriately. • Be able to select appropriate ranges or intervals of measurements. • Explain how repeating measurements impacts on data collection. • Recognise when measurements or data are unreliable and be able to take steps to improve this. • **Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.**
Testing	• Find ways to solve problems • Find new ways to do things • Test their ideas.	• When prompted, say what is happening/has happened to things or events. • With help, make changes and say what has changed • Be able to compare features of two objects. • Be able to identify two variables in an investigation, e.g. water and light when investigating plant growth. • Suggest a practical way to find something out. • Be able to identify things to measure and things to observe. • Be able to set up a comparative test. • Start to recognise when a test is not fair and suggest improvements.	• Suggest a practical way to find something out. • Make decisions about which practical method is best to find something out. • Be able to identify two variables in an investigation, e.g. water and light when investigating plant growth. • Be able to set up a comparative test. • Recognise when a simple fair test is necessary to answer a scientific question. • Be able to identify variables to measure and variables to observe. • With others, help to set up a fair test. • Start to recognise when a test is not fair and suggest	• Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. • Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. • Be able to state clearly which is the change variable and which is the measurement variable in a fair test. • Systematically identify the effect of changing one variable at a time. • Recognise that some variables may be more significant than others in investigations. • Be able to justify their choice of method as being appropriate to answer their investigative

		• **Perform simple tests.**	improvements. • Be able to develop features of a test to give a better outcome. • **Setting up simple practical enquiries, comparative and fair tests.** • **Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.**	question. • Be able to use their results to identify when further tests and observations might be needed. • Compare their own results with others' and suggest reasons why there may be differences • Recognise the limitations of tests. • **Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.** • **Using test results to make predictions to set up further comparative and fair tests.**
Identifying and classifying	• Sort and match objects and living things using given criteria. • Begin to think or their own ways of sorting a selection of objects or living things. • Tell an adult why they have sorted things in a certain way. • Develop ideas of grouping, sequences, cause and effect Know about similarities and differences in relation to places, objects, materials and living things. • **Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.**	• Sort and match objects and living things in their own way. • Sort and group objects and living things in different ways. • Recognise similarities and differences. • Use simple observable features to compare objects or living things. • Be able to describe how they sorted objects. • Use observable features of objects to identify them. • Begin to classify and identify by linking observable features to already known objects or things. • Explain which observable features have led them to classify in a particular way. • **Identify and classify**	• Use simple observable features to compare objects or living things. • Be able to group objects and living things in different ways. • Talk about criteria for grouping, sorting and classifying. • Use observable features of objects to identify them. • Use simple keys. • Begin to classify and identify by linking observable features to already known objects or things. • Begin to classify by behavioural features, e.g. conducts electricity, and is magnetic. • Explain which observable or behavioural features have led them to classify in a particular way. • Be able, independently, to use simple databases or keys to identify or classify living things, objects or events.	• Be able, independently, to use simple databases or keys to identify or classify living things, objects or events. • Be able to discuss reasons why living things are placed in one group and not another. • Suggest reasons for similarities and differences. • Begin to understand that broad groupings, such as micro-organisms, plants and animals can be subdivided. • Identify the positive aspects and limitations of some forms of classification. • Use and develop keys and other information records to identify, classify and describe living things and materials. • Create more complex forms of classification tools, e.g. databases, branching keys • Create and use a variety of sources to identify and classify living things, objects and phenomena.
Pattern spotting	• Notice and talk about similarities and difference in objects and living things. • Talk about what changes they have observed. • Make predictions with support or prompting, talk about what they think might happen based on their own experiences.	• Notice what has changed when observing things or events. • Talk about what they have found out or what they think may happen. • Begin to recognise links between observations and answers to questions. • With help, begin to notice patterns	• Recognise links between observations and answers to questions • Notice patterns and relationships. • Look for naturally occurring patterns and relationships and decide what data to collect to identify them. • Be able to collect data from their	• identify patterns that might be found in the natural environment. • Systematically investigate the relationship between phenomena, e.g. light and shadows. • Look for different causal relationships in their data and identify evidence that refutes or supports their ideas.

	• **Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.**	and relationships. • Begin to use simple scientific language to talk about what they have found out. • Be able to communicate their ideas to a range of audiences in a variety of ways. • Use evidence to suggest answers to questions and make predictions. • Say whether what happened was what they expected. • **Using their observations and ideas to suggest answers to questions.**	own observations and measurements. • With help, look for changes, patterns, similarities and differences in their data. • Use patterns in their data to draw simple conclusions and answer questions. • Use evidence to answer questions and make predictions. • Say whether what happened was what they expected • With support, identify new questions arising from the data. • Make predictions for new values within or beyond the data they have collected. • Find ways of improving what they have already done. • Link results to their own experiences. • Recognise when a result seems unusual when compared with other values. • Identify when repeated results are necessary. • **Identifying differences, similarities or changes related to simple scientific ideas or processes.**	• Analyse functions, relationships and interactions more systematically. • Find out about how scientific ideas have changed and developed over time as new evidence is discovered, e.g. ideas about the solar system. • Recognise when evidence supports an idea or not. • Be able to identify and offer explanations for anomalous result. • **Identifying scientific evidence that has been used to support or refute ideas or arguments.**
Research	• Understand they can find out more information from non-fiction books. • Talk about what they have found out from books, photographs, videos.	• Use simple secondary sources, e.g. books, film, internet, to find information. • Use information from secondary sources to help answer a question. • **Gather data to help answer questions.**	• Use information from secondary sources to help answer a question. • Recognise when and how secondary sources might help answer questions that cannot be answered through practical investigations.	• Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. • Use secondary sources, e.g. internet links to research objects, events and phenomena that cannot be experienced in the classroom, e.g. planetary movements, animals from around the world. • Gather and record data to help in answering questions. • **Identifying scientific evidence that has been used to support or refute ideas or arguments.**

Reporting	• Talk about what happened and what they found out. • Contribute to class displays/ charts/ records of their science learning. • Some children may choose to represent their science learning through mark making/ creative self-chosen activities. • **Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate.**	• Be able to record their findings in charts. • Make some independent choices about appropriate ways to record data. • Select the best way of presenting information from a range of options. • **Gather and record data to help in answer questions.** • **Use their observations to suggest answers to questions.**	• Use notes, simple tables and standard units. • Help to make decisions about how to record and analyse data. • Make independent choices about appropriate ways to record data. • Use relevant scientific language to discuss their ideas**.** • Communicate findings in ways that are appropriate to different audiences. • Identify relevant evidence used to draw conclusions. • Use scientific language and facts to describe processes and what they have observed. • Explain findings reported and recorded using more complex scientific language. • **Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.** • **Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.** • **Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.**	• Decide how to record data from a choice of familiar approaches. • Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and talk about how scientific ideas have developed over time. • Decide on the most appropriate method to present findings graphically, e.g. using a line graph or bar chart for different types of data. • Justify what type of presentation is appropriate to use. • Explain findings using data to identify causal relationships. • **Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.** • **Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations**